

ABSTRACT

Developed is high-efficiency synthesis method and apparatus capable of promoting the initial growth of carbon nanostructure by eliminating the initial fluctuation time and rising time in raw gas flow quantity.

A high-efficiency synthesis method of carbon nanostructure according to the present invention is a high-efficiency synthesis method of carbon nanostructure, the method comprising: bringing raw material gas and a catalyst into contact with each other under reactive conditions so as to produce a carbon nanostructure, wherein: the initiation of contact of the raw material gas with the catalyst is carried out instantaneously. Reaction conditions such as temperature and raw material gas concentration are set so as to meet those for catalyst growth, and under the reaction conditions, the initiation of contact of raw material gas G with catalyst 6 is carried out instantaneously. Consequently, the initial growth of carbon nanostructure is positively carried out, and the height growth and thickness growth thereof can be effected in high efficiency. Further, high-density growth and short-time high-speed growth can be realized. The catalyst includes any forms of catalyst such as catalyst substrate, catalyst structure, catalyst powders and catalyst pellet. It is especially preferred to employ a system wherein the feed and interruption of the raw material gas G are intermittently controlled by means of an electromagnetic three-way valve 24.